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ABSTRACT

The Reading Progress Scale (RPS) was administered to 4,714 students from 46 courses ranging from accounting to welding at Lansing Community College in two studies conducted from fall 1975 to spring 1976. The scale which assesses reading skills sought to answer two research questions: (1) is the RPS a good indicator of student persistence in a common course?; and (2) for those students who receive a grade of 0=F through 4=A (such students were defined to be persistors), is the RPS a good predictor of course grade? In the pilot study the RPS was seen as a good predictor of student persistence in only one of 46 course groups--basic composition. Significant correlations were found between the RPS and course grade in 17 of the 46 courses. Scatter plots indicating the nature of the relationship between RPS and course grade were nearly circular, suggesting that the RPS should not be used as a linear predictor of course grade. In the second study only 13 of 40 course groups showed a relationship between RPS and course grade. The data thus suggest that the RPS score and course grade are not consistently related. There exists little evidence in educational research to indicate that a single variable, such as reading level, should be a good predictor of either student persistence or academic performance. (MB)

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LANSING COMMUNITY COLLEGE

READING STUDY

by

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INTRODUCTION

For years there has been a belief held by faculty members that poor reading skill is a major barrier to student learning. This belief is particularly strong in those disciplines in which significant amounts of assigned reading are required. The logic is clear. If a student of low reading level enrolls in a course in which reading is of great importance, then the student can not succeed. Suppose, for the moment, that we accept such a conclusion without question. It follows that we are obligated to identify the poor reader prior to enrollment and advise such a student to seek remediation of the reading problem. The Department of Communication at Lansing Community College provides several courses specifically designed for students who need improvement in basic reading skills.

Identification of the reading level of large numbers of students is not a small task. Administration of the traditional measures of reading level is cumbersome due to the length and format of the tests. The college required a short, easily scored, reliable and valid measure which could be administered during registration. The Reading Study Committee of the Department of Communication selected a test which seemed to meet these criteria.

The Reading Progress Scale (RPS) developed by Carver (1971) was chosen to assess reading skills. There are four paragraphs included in the test representing four levels of difficulty. RPS test scores range from 0, 1, 2, 3, and 4. Each RPS reading level corresponds to a school grade reading level: RPS 0 - less than grade 1, RPS 1 - grades 1-3, RPS 2 - grades 4-6, RPS 3 - grades 7-9 and RPS 4 - grades 10-12. The test is administered at registration to first term students at the college. The original Carver test was adapted to "streamline" the test format, to clarify directions and to generally expedite the testing and the evaluation process. In addition, some minor editorial changes were also made in the test.

Carver reported that good scaler qualities existed in the original test. Only a small number of students were found to "fail" a paragraph at an intermediate level only to pass a paragraph at a higher level of difficulty. The reliability of the test was also high. Students were tested on two alternate forms of the test and the relationship between the two scores was examined. Thirdly, the test appears to be a valid measure of reading level. Elementary, intermediate, and high school students were tested using the RPS. The modal RPS levels for each grade were somewhat higher than the grade levels and corresponding RPS scores indicated in the test booklet. However, the median RPS levels and corresponding school grade were in good agreement with those reported in the test booklet.

The initial implementation of the RPS occurred at LCC in the Spring term, 1975. In the Fall of 1975 two specific research questions were proposed concerning the RPS scores. They were:

1. Is the RPS a good predictor of student persistence in a common course?

2. Is the RPS a good predictor of course grade for those students who receive a grade of 0=F through 4=A? (Such students are defined to be persistors.)

A research study (hereafter called the pilot study) was designed to attempt to answer these two questions. Forty-six (46) courses or groups of courses felt to be representative were selected. From these courses 2,970 students had been RPS tested. Using each of the 46 courses or course groups as the unit of analysis the relationships between the RPS score and (a) persistence and (b) course grade, were examined.

The results of the pilot study were not felt to be conclusive in dealing with the second question, the relationship between RPS score and course grade. Consequently a second study was proposed. For this study course groups were randomly selected from college departments and divisions. In addition the number of students with RPS scores of 0, 1, 2 was increased by extending the time span to include student performance in the selected courses for Winter and Spring terms as well as Fall term.

METHOD

Pilot Study

Forty six (46) courses assumed to be representative were selected ranging from Accounting to Welding. In total 2,973 students were RPS tested and their progress in the Fall term 1975 was monitered regarding persistence and final course grade. Persistence was operationally defined as those students who completed the course receiving a grade of A, B, C, D or F.

To answer Question 1: Is the RPS a good predictor of student persistence in common courses? - all students were classified as persistors or non-persistors (dropouts). A Chi-Squared (X^2) test of independence was used to analyze the data. Each course group was considered to be the unit of analysis.

To answer Question 2: Is the RPS a good predictor of course grade in common courses? - a two step analysis was developed. The first step of the analysis attempted to identify the nature of the relationship between course grade and RPS score. To identify this relationship, scatter plots were developed with the Reading Progress score (0-4) on the X axis and the Course grade (0-4) on the Y axis. The second step in this analysis used a simple regression approach to determine if Reading Progress scores could predict course grades. The regressions also produced correlation coefficients between RPS level and course grade in each group.

Second Study

In the pilot study some of the 46 common course groups did not have an adequate distribution of RPS levels within the group. In the second study, this problem was solved by selecting 40 course groups across three terms: Fall 1975, Winter 1976 and Spring 1976. The course groups were distributed uniformly by division and department and sections were selected randomly. A side benefit of this step was the increase of the overall N to 4,714.

To answer the Question: Is the RPS a good predictor of course grade in common courses, a Statistical Package for the Social Sciences (SPSS) Crosstabs Routine was run. The Chi-Squared (X^2) test of independence was used to determine whether or not the RPS score was related to course grade. Contingency Coefficients (C), based upon the X^2, were calculated to indicate the degree or the extent of the association between the two variables, RPS and course grade. Each Contingency Coefficient was corrected to range from 0.0 to 1.0. In addition, the Lambda statistic was used because of its value as an asymetrical indicator of association and the proportional reduction in error term (PRE) which indicates the degree to which one variable may be predicted from knowledge of the other variable.

RESULTS

Pilot Study

Table I summarizes the results of the pilot study. In answer to the first question: Is the RPS a good predictor of student persistence in common courses? - a significant X^2 was found only in one (1) of the forty-six (46) course groups. In the Communications courses 121-123, the basic composition program, a relationship was found to exist between persistence and reading ability as measured by the RPS. Column 1 indicates the course group, column 2 the number of RPS tested students in the course(s), column 3 the X^2 value and the fourth column indicates the correlation between the RPS and course grade. Significant correlations are asterisked.

In answer to the second question, significant correlations were found between the RPS and course grade in 17 of the 46 course(s). These were Accounting, Aviation Flight Training, Business, Court and Conference Reporting, Communications, Chemistry, Electronics Technology, Hotel-Motel Food, Humanities, Law, Mathematics, Natural Science, Psychology, Reading, Social Science, Social Work.

The scatter plots indicating the nature of the relationship between RPS and course grade were nearly circular. This would suggest that RPS should not be used as a linear predictor of course grade.

TABLE 1 - PILOT STUDY
FALL TERM 1975

Group	Course Titles	N	* X^2	R
1	ACCOUNTING	62	3.49	.34*
2	AVIATION FLIGHT TRAINING		INC	.64*
3	ANATOMY & PHYSIOLOGY	36	2.85	-.01
4	ART	74	3.79	.10
5	ARCHITECTURAL TECHNOLOGY	23	3.39	.10
6	APPLIED TECHNOLOGY-RELATED	41	2.56	-.07
7	AUTOMOTIVE	51	7.34	.20
8	BIOLOGY		INC	.18
9	BUILDING TRADES		INC	.23
10	BUSINESS 010-095	9	2.04	.29
11	BUSINESS 100-102	59	1.59	.21
12	BUSINESS 104-114	71	7.47	.22*
13	BUSINESS 117-295	189	4.9	.21*
14	COURT CONFERENCE REPORTING	23	.18	.36*
15	CHEMISTRY 010		INC	.12
16	CHEMISTRY 100-181	44	3.06	.36*
17	CONTINUING HEALTH CAREERS	64	8.34	.17
18	COMPOSITION	636	12.39*	.23*
19	DANCE-CONTACT	30	.53	.05
20	DATA PROCESSING	39	.65	.26
21	DRAFTING TECHNOLOGY	19	.70	-.06
22	ECONOMICS		INC	.17
23	EDUCATION		INC	INC
24	ENGLISH		INC	.05
25	ELECTRONICS TECHNOLOGY	33	1.89	.48*
26	HEATING & AIR CONDITIONING	9	.62	-.06
27	HOTEL MOTEL FOOD	29	2.84	.46*
28	HISTORY	37	.63	-.11
29	HUMANITIES	138	.36	.19*
30	LAW	36	.86	.34*
31	LAW ENFORCEMENT	64	7.77	.06
32	MATHEMATICS 009-102	63	.81	.42*
33	MATHEMATICS 156-213		INC	.07
34	MUSIC	53	.72	.16
35	NATURAL SCIENCE	170	6.27	.28*
36	PHYSICAL EDUCATION		INC	.12
37	PHOTOGRAPHY	18	.49	-.13
38	PSYCHOLOGY	143	3.84	.30*
39	READING	81	4.85	.35*
40	STUDENT DEVELOPMENT	32	3.17	.20
41	SPEECH		INC	.06
42	SOCIAL SCIENCE	477	1.7	.18*
43	SOCIAL WORK	33	6.10	.31*
44	TECHNOLOGY-GENERAL		INC	.05
45	THEATRE	7	1.29	.13
46	WELDING	13	.75	.42

*X^2 = 9.49
p = .05
df = 4
INC-data not available

Second Study

In Table II the data analysis is summarized. The X^2 significance level indicated in Table II is essentially the Alpha level for each calculated X^2 value. An Alpha level of .05 or less is generally considered to be acceptable. Those Alpha levels at .05 or less have been asterisked (*). In groups 5, 9, 10, 11, 17, 19, 23, 30, 31, 33, 35, 37 and 39 the calculated X^2's were observed to be significant. Therefore, in those courses the Reading Progress Scale Score and course grade appear to be related.

In the fourth column the lambda statistic is given for each group where course grade was considered to be the dependent or predicted variable. For example in group 3 the lambda was 3.7%. Therefore for that course the error in predicting course grade is reduced by approximately 4% by knowing the student's RPS score. In group 15 lambda was calculated to be 4.3% when course grade was treated as the dependent variable. However, when RPS was treated as the dependent measure the error in predicting RPS given course grade is reduced by 11%. In Table II a double asterisk (**) indicates those groups where course grade is a better predictor of RPS than visa versa.

In the fifth column of Table II the Contingency Coefficient (C) is given for each group. Significant C's are indicated by an asterisk.

In general the data from this analysis indicates that in only 13 of the 40 groups are the variables RPS and course grade related. In 27 cases the variables are independent. Secondly, where the variables RPS and course grade do appear to be related, in four of those 13 groups, course grade is a better predictor of reading scores than reading score(s) is of course grade. In addition, a majority of the predictors (lambdas) are small, thus only minor gains in predictability are made by knowing a student's RPS score.

In the second column in Table II the reading level for each course is given as assessed by the Reading Clinic. Although a majority of the courses in which grade and RPS were found to be related are level 4 courses (groups 39, 37, 31, 23, 19, 5), courses 10, 11, 17 are level 3 courses, courses 33 and 9 are level 2 courses, and course 30 is a level 1. From this data, it would appear that the readability level of the course(s) is probably not a factor in the relationship between reading score and course grade.

TABLE II

Data Analysis Summary
Depicting the Relationship Between
Reading Level Scores and Course Grades

Group	Reading Level	X^2 (Significance Level)	lambda (Grade as dependent)	Contingency Coefficient
1	4	--	--	--
2	3/4	.58	0.0	.27
3	4	.37	3.7%**	.40
4	2-3	.73	5.5%	.39
5	4	.03*	3% **	.71*
6	3	.27	13.7%**	.65
7	3/4	.15	3.7%**	.63
8	3	.50	0.0	.33
9	2	.01*	14.8&	.52*
10	3	.03*	11%	.55*
11	3	.01*	6.8%	.60*
12	3	.12	10%	.42
13	3/4	.18	3.0%	.35
14	3/4	.09 marginal	6.5%**	.54
15	3	.38	4.3%**	.60
16	4	.35	0.0**	.40
17	3	.001*	6.4%	.29*
18	4	.5	3.3%**	.54
19	3-4	.001*	3.4%	.48*
20	3	.09 marginal	13.7%**	.62
21	4	.46	15.7%	.63
22	4	.94	0.0	.36
23	4	.02*	9.2	.42*
24	3	.12	8.0%	.50
25	3	.14	6.6%	.56
26	4	.06 marginal	12.7%	.45
27	4	.27	12%	.29
28	4	.17	2.4%	.41
29	3/4	.37	5.4%	.38
30	1	.001*	2.0%**	.58*
31	4	.04*	12.1%**	.68*
32	4	--	--	--
33	2	.001*	5.3%	.43*
34	3	.29	2.9%	.50
35		.04*	3.5%	.51*
36	4	.77	0.0	.10
37	4	.01*	.6%	.28*
38	4	.14	5.2%	.33
39	4	.03*	10%**	.68*
40	4	.98	0.0**	.56

*P=.05

TABLE III

Data Analysis Summary
Depicting the Relationship Between
Reading Level Scores and Academic Success

Group	Reading Level	X^2 (Significance Level)	lambda (Grade as dependent)	Contingency Coefficient
1	4	---	--	--
2	3/4	.34	7.5%	.17
3	4	.35	3.1%	.22
4	2-3	.25	6.3	.32
5	4	.04*	25% (3%)	.59
6	3	.85	0.0	.20
7	3/4	.48	0.0	.26
8	3	.63	0.0	.12
9	2	.01*	21% (15%)	.48
10	3	.31	4.5	.28
11	3	.01*	14.2% (7%)	.54
12	3	.01*	7.9% (10%)	.36
13	3/4	.13	0.0	.23
14	3/4	.92	0.0	.13
15	3	.40	0.0	.33
16	4	.64	0.0	.19
17	3	.01*	0.0	.19
18	4	.15	0.0	.44
19	3-4	.001*	11.4% (3.4%)	.45
20	3	.169	0.0	.41
21	4	.34	0.0	.42
22	4	.67	0.0	.21
23	4	.01	3.1%	.32
24	3	.10	0.0	.34
25	3	.04*	10%	.43
26	4	.01*	19.4% (13%)	.46
27	4	.11	3.1%	.30
28	4	.38	0.0	.20
29	3/4	.24	0.0	.25
30	1	.001*	5.7%	.42
31	4	.22	18%	.41
32	4	---	--	--
33	2	.001*	1.9%	.39
34	3	.19	3.2%	.31
35		.01*	11.8% (3.5%)	.42
36	4	---	--	--
37	4	.04*	0.0	.17
38	4	.31	0.0	.16
39	4	.03*	0.0**	.55
40	4	.54	0.0	.40

*P=.05

In a second analysis the nature of the relationship between the RPS score and Academic success, operationally defined as Pass including A, B, C and P and Fail including D and F was examined. Table III summarizes the results of this analysis. With the exception of course groups 12 and 25 the courses in which a relationship was found to exist are the same.

In the fourth column of Table III the Lambda statistic is given for each group where academic success was considered to be the dependent or predicted variable. Although the reduction of the dependent variable categories to pass/fair did not pointedly affect the number of cases where RPS and course grade were found to be dependent, as might be expected it did appear to affect the error in predicting academic success given RPS score. The error rate in predicting success given a student's RPS score was substantially reduced in groups 4, 9, 11, 12, 19, 26 and 35.

Discussion

The data suggest that the RPS score and course grade are not consistently related. However, for those courses where RPS and course grade are related, the Reading Score is a fair predictor of success or failure in that course.

There exists little evidence in educational research to indicate that a single variable, such as reading level, should be a good predictor of either student persistence or student academic performance. A series of references listed in the bibliography cite many of the components which are related to academic achievement. It is interesting that we are able to summarize the results of so many studies in a simple way. Future academic achievement is best predicted by past academic achievement. The same statement may be made with regard to student persistence. Achievement is a function of many components which interact, rather than perform independently to influence student performance.

In light of these results and the Spiller and Hall (1978) study which examined the relationship between the Nelson-Denny Reading test and success in English Courses as well as Cummulative GPA, the relationship between the RPS level and Cummulative GPA was examined. The Cummulative GPA was obtained for all students who were participants in the second study, across course groups, during the Summer of 1978. At this time only 17% of the students had attended Spring Term 1978, 83% had not. Therefore, for a majority of the students the Cummulative GPA represents their final academic evaluation.

The relationship between the RPS level and Cummulative GPA was significant ($X^2 = 131.5$, df=12). From this data an expectancy table was compiled. (See Table IV). Failure was defined as a Cummulative GPA less than 1.0. Students who score a 0 have a 47% chance of failure while students scoring 4 have a 90% chance of success.

Implications

As a result of these LCC Reading Studies as well as similar data presented by others, it would seem that the merits of the Reading Progress Scale lie in its expedient assessment of reading ability at a time when remediation can be recommended.

Over an extended time period the probability of academic failure is reduced as reading level increases.

TABLE IV

CUMMULATIVE G.P.A.

RPS Score	less than .99	1.0-1.9	2.0-2.9	3.0-4.0
0	47%	6.5%	26.5%	20%
1	30%	11 %	36 %	23%
2	22%	18.5%	38.5%	21%
3	16%	19 %	37 %	28%
4	10%	15%	31 %	44%

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